Newland
Newland Taiwan Inc.

EM2037 Series

Embedded 2D Barcode Scan Engine
User Guide

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Revision History

Version	Description	Date
V1.0.0	Initial release.	January 4, 2013
V1.0.1	Corrected inappropriate expressions and misspellings	January 17, 2013
V1.0.2	Replaced hard-to-read barcodes	April 9, 2013
V1.1.0	Updates: 1. Added the **Obtain Firmware Version** feature in Chapter 1. 2. Added the USB HID-KBW **Fast Mode**, **Speed** features and modified the **Emulate Numeric Keypad** feature in Chapter 2. 3. Added the **Power LED** feature in Chapter 6. 4. Added the **Modify ISSN Code ID** and **Modify Micro PDF417 Code ID** barcodes in Chapter 7. 5. Added the **UPC-E/UPC-A Preamble Character**, **Convert UPC-E to UPC-A**, **Convert Code 39 to Code 32 (Italian Pharma Code)**, **Code 32 Prefix**, **Set Length Range for UCC/EAN-128** and **Micro QR** features and two symbologies of ISSN and Micro PDF417 in Chapter 8. **Note: You must have firmware version V3.06.071 or higher to use the new features above.**	January 5, 2015

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0006010
Enter Setup

Chapter 1 Getting Started

Introduction

The EM2037 series embedded 2D barcode scan engines are armed with CMOS image capturer and the Newland patented UIMG®, a computerized image recognition system, featuring fast scanning and accurate decoding on barcodes on virtually any medium - paper, magnetic card, mobile phones and LCD displays. The EM2037s can be easily integrated into OEM equipments or systems, such as hand-held, portable, or stationary barcode scanners.

Moreover, the EM2037s open image acquisition interface, data interface and I/O interface to OEM developers to allow their special integration needs. EM2037 Software Development Kit is provided for easy and quick development of OEM applications.

About This Guide

This guide provides programming instructions for the EM2037. Users can configure the EM2037 by scanning the programming barcodes included in this manual.

The EM2037 has been properly configured for most applications and can be put into use without further configuration. Users may check the Factory Defaults Table in Appendix for reference. Throughout the manual, programming barcodes marked with asterisks (**) are factory default values.

Document Set

EM2037 related documents include:

NLS-EM2037 Series Embedded 2D Barcode Scan Engine Integration Manual:	Describes how to integrate the EM2037.
NLS-EM2037 Series Embedded 2D Barcode Scan Engine User Guide:	Describes how to use and program the EM2037.
Sample Barcodes:	Provides sample barcodes for testing the EM2037.

Connecting EVK to PC

The supplied EM2037 EVK tool can assist users in application development for the EM2037. You can connect EM2037 EVK to PC via a USB connection or an RS-232 connection. In case of USB connection, a driver is required if EVK wants to communicate with EM2037 and receive decoded data through virtual serial port.

0006000
****Exit Setup**

0006010
Enter Setup

Barcode Scanning

Powered by area-imaging technology and Newland patented UIMG® technology, the EM2037 features fast scanning and accurate decoding. Barcodes rotated at any angle can still be read with ease. When scanning a barcode, simply center the aiming beam or pattern projected by the EM2037 over the barcode.

Barcode Programming

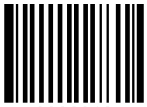
Scanning the **Enter Setup** barcode can enable the engine to enter the setup mode. Then you can scan a number of programming barcodes to configure your engine. To exit the setup mode, scan the **Exit Setup** barcode.

If the engine has exited the setup mode, only some special programming barcodes, such as the **Enter Setup** barcode and **Restore All Factory Defaults** barcode, can be read.

0006010
Enter Setup

0006000
**** Exit Setup**

Programming barcode data can be transmitted to the Host. Scan the appropriate barcode below to enable or disable the transmission of programming barcode data (i.e. the characters under programming barcode) to the Host.


0002010
Transmit Programming Barcode Data

0002000
**** Do Not Transmit Programming Barcode Data**

0006010
Enter Setup

Factory Defaults

Scanning the following barcode can restore the engine to the factory defaults. See **Appendix 1: Factory Defaults Table** for more information.

Restoring the engine to factory defaults will not remove custom defaults stored on the engine.

0001000
Restore All Factory Defaults

Note: Use this feature with discretion.

Custom Defaults

Scanning the **Restore All Custom Defaults** barcode can reset all parameters to the custom defaults. Scanning the **Save as Custom Defaults** can set the current settings as custom defaults.

Custom defaults are stored in the non-volatile memory.

0001150
Save as Custom Defaults

0001160
Restore All Custom Defaults

0006000
****Exit Setup**

0006010
Enter Setup

Product Information

Obtain Product Information: Transmit the product information to the Host straight away via the communication interface.

Obtain Firmware Version: Transmit the firmware version to the Host straight away via the communication interface.

0003000
Obtain Product Information

0003001
Obtain Firmware Version

Send Product Information at Startup: Transmit the product information to the Host when the engine is powered on. This feature only applies to engines using a serial communication interface.

0007010
Send Product Information at Startup

0007000
**** Do Not Send Product Information at Startup**

0006000
**** Exit Setup**

0006010
Enter Setup

Chapter 2 Communication Interfaces

Introduction

The EM2037 engine provides a TTL-232 interface and a USB interface to communicate with the host device. The host device can receive scanned data and send commands to control the engine or to access/alter the configuration information of the engine via the TTL-232 or USB interface.

Serial Communication Interface

Serial communication interface is usually used when connecting the engine to a host device (like PC, POS). However, to ensure smooth communication and accuracy of data, you need to set communication parameters (including baud rate, parity check, data bit and stop bit) to match the host device.

The serial communication interface provided by the engine is based on TTL-level signals. TTL-232 can be used for most application architectures. For those requiring RS-232, an external conversion circuit is needed. The conversion circuit is available only to some models.

1100000
Serial Communication

Default serial communication parameters are listed below. Make sure all parameters match the host requirements.

Parameter	Factory Default
Serial Communication	Standard TTL-232
Baud Rate	9600
Parity Check	None
Number of Data Bits	8
Number of Stop Bits	1
Hardware Auto Flow Control	None

0006000
****Exit Setup**

0006010
Enter Setup

Baud Rate

Baud rate is the number of bits of data transmitted per second. Set the baud rate to match the Host requirements.

0100030
**** Baud Rate 9600**

0100050
Baud Rate 19200

0100000
Baud Rate 1200

0100060
Baud Rate 38400

0100010
Baud Rate 2400

0100070
Baud Rate 57600

0100020
Baud Rate 4800

0100080
Baud Rate 115200

0100040
Baud Rate 14400

0006000
**** Exit Setup**

0006010
Enter Setup

Parity Check

0101000
**** None**

0101010
Even Parity

0101020
Odd Parity

Data Bit

0103030
**** 8 Data Bits**

0103010
6 Data Bits

0103020
7 Data Bits

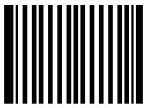
0103000
5 Data Bits

0006000
****Exit Setup**

0006010

Enter Setup

Stop Bit



0102000

**** 1 Stop Bit**

0102010

2 Stop Bits

Hardware Flow Control

If this feature is enabled, the engine determines whether to transmit data based on CTS signal level. When CTS signal is at low level which means the serial port's cache memory of receiving device (such as PC) is full, the engine will not send data through serial port until CTS signal is set to high level by receiving device. When the engine is not ready for receiving, it will set RTS signal to low level. When sending device (such as PC) detects it, it will not send data to the engine any more to prevent data loss.

If this feature is disabled, reception/transmission of serial data will not be influenced by RTS/CTS signal.

0104010

Enable Hardware Flow Control

0104000

**** Disable Hardware Flow Control**

Note: Before enabling this feature, make sure that RTS/CTS signal line is contained in RS-232 cable. Without the signal line, serial communication errors will occur.

0006000

**** Exit Setup**

0006010
Enter Setup

USB Interface

USB-DataPipe

A driver is required when using this protocol to communicate with the engine. Its advantages include fast data transmissoin and easy to use.

1100010
USB-Datapipe

USB HID-KBW

When you connect the engine to the Host via a USB connection, you can enable the **USB HID-KBW** feature by scanning the barcode below. Then engine's transmission will be simulated as USB keyboard input. The Host receives keystrokes on the virtual keyboard. It works on a Plug and Play basis and no driver is required.

1100020
USB HID-KBW

0006010
Enter Setup

Fast Mode

When **Fast Mode On** is selected, the engine sends characters to the Host faster. If the Host drops characters, do not use Fast Mode.

1103160
**** Fast Mode Off**

1103161
Fast Mode On

0006000
**** Exit Setup**

0006010
Enter Setup

USB HID-KBW Speed

This parameter specifies the USB poll rate for a USB keyboard. If the Host drops characters, change the poll rate to a bigger value.

1103170
1ms

1103171
2ms

1103172
3ms

1103173
**** 4ms**

1103174
5ms

1103175
6ms

1103176
7ms

1103177
8ms

1103178
9ms

1103179
10ms

0006000
****Exit Setup**

0006010
Enter Setup

USB Country Keyboard Types

Keyboard layouts and country codes vary from country to country. All supported keyboard types are listed in the **Country Code Table**. The default setting is US keyboard type.

To learn how to select a keyboard type, see the example below.

1103000
Select Country Code

Country Code Table (Appendix 5)

Country/Language	Code	Country/Language	Code
US	0	Netherlands(Dutch)	14
Belgium	1	Norway	15
Brazil	2	Poland	16
Canada(French)	3	Portugal	17
Czechoslovakia	4	Romania	18
Denmark	5	Russia	19
Finland(Swedish)	6	Slovakia	21
France	7	Spain	22
Germany/Austria	8	Sweden	23
Greece	9	Switzerland(German)	24
Hungary	10	Turkey F	25
Israel(Hebrew)	11	Turkey Q	26
Italy	12	UK	27
Latin-American	13	Japan	28

0006010
Enter Setup

Example: Program the engine to emulate Norwegian keyboard (Norway)

1. Scan the **Enter Setup** barcode.
2. Scan the **Select Country Code** barcode.
3. Check the country code for Norway in the Country Code Table. (Norway: 15)
4. Scan the numeric barcodes “1” and “5”.
5. Scan the **Save** barcode.
6. Scan the **Exit Setup** barcode.

Beep on Unknown Character

Due to the differences in keyboard layouts, some characters contained in barcode data may be unavailable on the selected keyboard. As a result, the engine fails to transmit the unknown characters.

Scan the appropriate barcode below to enable or disable the emission of beep when an unknown character is detected.
Note: If **Emulate ALT+Keypad ON** is selected, **Beep on Unknown Character** does not function.

1103031
Beep on Unknown Character

1103030
**** Do Not Beep on Unknown Character**

Emulate ALT+Keypad

When Emulate ALT+Keypad is turned on, any ASCII character (0x00 - 0xff) is sent over the numeric keypad no matter which keyboard type is selected. Since sending a character involves multiple keystroke emulations, this method appears less efficient.

1103061
Emulate ALT+Keypad ON

1103060
**** Emulate ALT+Keypad OFF**

0006000
****Exit Setup**

0006010

Enter Setup

Function Key Mapping

When Function Key Mapping is enabled, function characters (0x00 - 0x1F) are sent as ASCII sequences over the numeric keypad. For more information, see **Appendix 6: ASCII Function Key Mapping Table**.

A shortcut to send a function key (F1-F12) is to scan the corresponding barcode in **Appendix 9: F-Key Barcodes**.

Note: Emulate ALT+Keypad ON prevails over **Enable Function Key Mapping**.

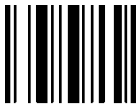
1103140

Enable Function Key Mapping

1103130

**** Disable Function Key Mapping**

Example: Barcode data 0x16

 T	Enable Function Key Mapping	Ctrl +V
	Disable Function Key Mapping	F1

0006000

**** Exit Setup**

0006010
Enter Setup

Inter-Keystroke Delay

This parameter specifies the delay between emulated keystrokes.

1103050
** **No Delay**

1103051
Short Delay (20ms)

1103052
Long Delay (40ms)

Caps Lock

The **Caps Lock ON** option can invert upper and lower case characters contained in barcode data. This inversion occurs regardless of the state of Caps Lock key on the Host's keyboard.

1103020
Caps Lock ON

1103010
** **Caps Lock OFF**

Note: Emulate ALT+Keypad ON/ **Convert All to Upper Case**/ **Convert All to Lower Case** prevails over **Caps Lock ON**.

Example: When the **Caps Lock ON** is selected, barcode data "AbC" is transmitted as "aBc".

0006000
****Exit Setup**

0006010

Enter Setup

Convert Case

Scan the appropriate barcode below to convert all bar code data to your desired case.

Note: If **Emulate ALT+Keypad ON** is selected, **Convert All to Lower Case** and **Convert All to Upper Case** do not function.

1103040

**** No Case Conversion**

1103041

Convert All to Upper Case

1103042

Convert All to Lower Case

Example: When the **Convert All to Lower Case** feature is enabled, barcode data “AbC” is transmitted as “abc”.

0006000

**** Exit Setup**

0006010
Enter Setup

Emulate Numeric Keypad

Do Not Emulate Numeric Keypad 1: Sending a number (0-9) is emulated as keystroke(s) on main keyboard.

Emulate Numeric Keypad 1: Sending a number (0-9) is emulated as keystroke(s) on numeric keypad. The state of Num Lock on the simulated numeric keypad is determined by its equivalent on the Host. If Num Lock on the Host is turned off, the output of simulated numeric keypad is function key instead of number.

Do Not Emulate Numeric Keypad 2: Sending "+", "—", "*" and "/" is emulated as keystroke(s) on main keyboard.

Emulate Numeric Keypad 2: Sending "+", "—", "*" and "/" is emulated as keystroke(s) on numeric keypad.

1103120
Emulate Numeric Keypad 1

1103110
**** Do Not Emulate Numeric Keypad 1**

1103151
Emulate Numeric Keypad 2

1103150
**** Do Not Emulate Numeric Keypad 2**

Note: Emulate ALT+Keypad ON prevails over **Emulate Numeric Keypad 1** and **Emulate Numeric Keypad 2**.

Example: Supposing the **Emulate Numeric Keypad 1** feature is enabled:

if Num Lock on the Host is ON, "A4.5" is transmitted as "A4.5";

if Num Lock on the Host is OFF, "A4.5" is transmitted as follows:

1. "A" is sent as is because it is not included in numeric keypad;
2. "4" is sent as the function key "Cursor Move to Left";
3. "." is sent as the function key "Delete After the Cursor";
4. "5" is not sent as it does not correspond to any function key.

0006000
****Exit Setup**

0006010
Enter Setup

USB COM Port Emulation

If you connect the engine to the Host via a USB connection, the USB COM Port Emulation feature allows the Host to receive data in the way as a serial port does. However, you need to set communication parameters on the engine to match the Host requirements.

1100060
USB COM Port Emulation

HID-POS

The HID-POS interface is recommended for new application programs. It can send up to 56 characters in a single USB report and appears more efficient than keyboard emulation.

Features:

- ✧ HID based, no custom driver required.
- ✧ Way more efficient in communication than keyboard emulation and traditional RS-232 interface.

Note: HID-POS does not require a custom driver. However, a HID interface on Windows 98 does. All HID interfaces employ standard driver provided by the operating system. Use defaults when installing the driver.

1100080
HID-POS

Access the engine with your program:

1. Use CreateFile to access the engine as a HID device.
2. Use ReadFile to deliver the scanned data to the application program.
3. Use WriteFile to send data to the engine.

For detailed information about USB and HID interfaces, go to www.USB.org.

Acquire Scanned Data

After a barcode is decoded, the engine sends an input report as below:

	Bit							
Byte	7	6	5	4	3	2	1	0
0	Report ID = 0x02							
1	Barcode Length							
2-57	Decoded Data (1-56)							
58-61	Reserved (1-4)							
62	Symbology ID Number (Appendix 7) or N/C: 0x00							
63	-	-	-	-	-	-	-	Decoded Data Continued

VID/PID

USB uses VID (Vendor ID) and PID (Product ID) to identify and locate a device. The VID is assigned by USB Implementers Forum. Newland's vendor ID is 1EAB (Hex). A range of PIDs are used for each Newland product family. Every PID contains a base number and interface type (keyboard, COM port, etc.).

Product	Interface	PID (Hex)	PID (Dec)
EM2037	Base	0000	0
	HID-POS	0010	16

0006010
Enter Setup

IBM SurePOS(Tabletop)

1100090

IBM-SurePOS (Table-Top)

IBM SurePOS (Handheld)

1100100

IBM-SurePOS (Hand-Held)

0006010
Enter Setup

Chapter 3 Scan Mode

Trigger Mode

If the Trigger Mode is enabled, receiving an active trigger signal activates a decode session. The session continues until the barcode is decoded or the active signal is not present. For good decode, the engine transmits decoded data via communication port. To activate another session, the Host needs to first terminate the trigger signal, wait 20ms or longer and then send an active signal.

0302000
Trigger Mode

Auto Mode

If the Auto Mode is enabled, the engine activates a decode session every time it detects a change in ambient illumination. The decode session continues until the barcode is decoded or the Decode Session Timeout expires.

Receiving a trigger signal can also activate a decode session. The decode session continues until the trigger signal becomes invalid or the barcode is decoded or the Decode Session Timeout expires. The trigger signal needs to be terminated before the engine is able to monitor ambient illumination again.

0302010
**** Auto Mode**

0006000
****Exit Setup**

0006010
Enter Setup

Decode Session Timeout

This parameter sets the maximum time decode session continues during a scan attempt in the Auto Mode. It is programmable in 1ms increments from 500ms to 3600000ms. The default timeout is 3000ms. To learn how to program this parameter, see the **"a. Program the Decode Session Timeout"** section in **Appendix 8**.

0313000
Decode Session Timeout

0006010
Enter Setup

Timeout between Decodes (Same Barcode)

Timeout between Decodes (Same Barcode) can avoid undesired rereading of same barcode in a given period of time.

This parameter sets the timeout between decodes for same barcode in the Auto Mode. It is programmable in 1ms increments from 0ms to 3600000ms. The default timeout is 1500ms.

To learn how to program this parameter, see the **"b. Program the Timeout between Decodes (Same Barcode)"** section in **Appendix 8**.

0313010
Timeout between Decodes (Same Barcode)

Disable Timeout between Decodes: Allow the engine to re-read same barcode.

Enable Timeout between Decodes: Do not allow the engine to re-read same barcode before the Timeout between Decodes (Same Barcode) expires.

0313020
**** Disable Timeout between Decodes**

0313030
Enable Timeout between Decodes

0006000
****Exit Setup**

0006010
Enter Setup

Continuous Mode

This mode enables the engine to scan/capture, decode and transmit over and over again.

If the Continuous Mode is enabled, the engine activates/suspends/resumes barcode reading through control over the trigger signal. When barcode reading is in progress, terminating the trigger signal after having kept it valid for 30ms or longer will suspend barcode reading; when barcode reading is suspended, performing the same control over the trigger signal will resume barcode reading.

0302020
Continuous Mode

0006010
Enter Setup

Timeout between Decodes (Same Barcode)

Timeout between Decodes (Same Barcode) can avoid undesired rereading of same barcode in a given period of time.

This parameter sets the timeout between decodes for same barcode in the Continuous Mode. It is programmable in 1ms increments from 0ms to 3600000ms. The default timeout is 1500ms.

To learn how to program this parameter, see the **"b. Program the Timeout between Decodes (Same Barcode)"** section in **Appendix 8**.

0313010

Timeout Between Decodes (Same Barcode)

Disable Timeout between Decodes: Allow the engine to re-read same barcode.

Enable Timeout between Decodes: Do not allow the engine to re-read same barcode before the Timeout between Decodes (Same Barcode) expires.

0313020

**** Disable Timeout between Decodes**

0313030

Enable Timeout between Decodes

0006000

****Exit Setup**

0006010
Enter Setup

Chapter 4 Scanning Preferences

Introduction

This chapter contains information as to how to adapt your engine to various applications with preference setting. For instance, to improve barcode reading performance off mobile phones and LCD displays; or to narrow the field of view of the engine to make sure it reads only those barcodes intended by the user.

Regular Mode/Mobile Phone Mode

The engine can capture barcodes printed on paper labels or displayed on the screen of a mobile phone. Select a mode as per actual need.

Regular Mode: Read barcodes printed on paper or plastic.

Mobile Phone Mode: Read barcodes off mobile phones or LCD displays.

0321000
**** Regular Mode**

0321020
Mobile Phone Mode

Decode Area

Whole Area Decoding

When this option is enabled, the engine attempts to decode barcode(s) within its field of view, from the center to the periphery, and transmits the barcode that has been first decoded.

0322000
**** Whole Area Decoding**

0006010
Enter Setup

Central Area Decoding

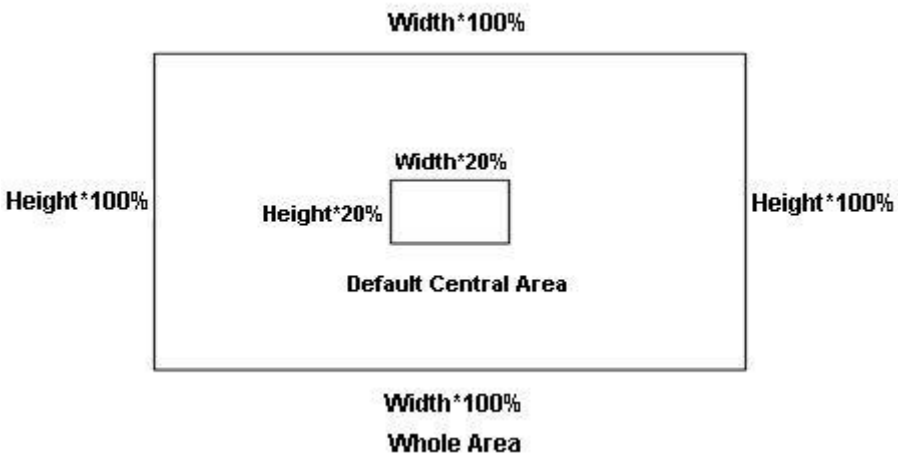
The engine attempts to decode barcode(s) within a specified central area and transmits the barcode that has been first decoded. This option allows the engine to narrow its field of view to make sure it reads only those barcodes intended by the user. For instance, if multiple barcodes are placed closely together, central area decoding in conjunction with appropriate pre-defined central area will insure that only the desired barcode is read.

0322010
Central Area Decoding

0006010
Enter Setup

Specify Central Area

The default central area is a (Width*20%) by (Height*20%) area in the center of the engine's field of view, as shown in the figure below. You can define the central area by scanning the **Specify Central Area** barcode and numeric barcode(s) corresponding to a desired percentage (1-100). If Central Area Decoding is enabled by scanning the **Central Area Decoding** barcode, the engine only reads barcodes that intersect the predefined central area.



To learn how to program this parameter, see the **"c. Program the Central Area"** section in Appendix.

0322020
Specify Central Area

0006000
** **Exit Setup**

0006010
Enter Setup

Chapter 5 Illumination & Aiming

Illumination

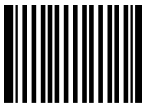
A couple of illumination options are provided to improve the lighting conditions during every image capture:

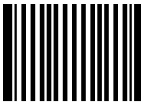
Normal: Illumination LEDs are turned on during image capture.

Always ON: Illumination LEDs keep ON after the engine is powered on.

OFF: Illumination LEDs are OFF all the time.

0200000
**** Normal**


0200010
Always ON


0200020
OFF

0006000
****Exit Setup**

0006010

Enter Setup

Aiming

When scanning/capturing image, the engine projects an aiming pattern which allows positioning the target barcode within its field of view and thus makes decoding easier.

Normal: The engine projects an aiming pattern only during barcode scanning/capture.

Always ON: Aiming pattern is constantly ON after the engine is powered on.

OFF: Aiming pattern is OFF all the time.

0201000

**** Normal**

0201010

Always ON

0201020

OFF

0006000

**** Exit Setup**

0006010
Enter Setup

Chapter 6 Beep & LED Indications

Introduction

Besides communication output, the engine can also generate a PWM signal and a pulse signal. Those outputs in conjunction with external circuits are able to drive the beeper/LED indicator.

This chapter describes how to program the beep/LED notification feature.

Startup Beep

If startup beep is enabled, the engine will beep after being turned on.

0204001
**** Enable Startup Beep**

0204000
Disable Startup Beep

Good Read Beep

The engine can be configured to beep after good decode. Beep type (frequency) and volume (duty circle of PWM) are also user programmable.

0203010
**** Good Read Beep On**

0203000
Good Read Beep Off

0006000
****Exit Setup**

0006010

Enter Setup

Beep Type

0203020

**** Type 1**

0203021

Type 2

0203022

Type 3

Beep Volume

0203030

**** Loud**

0203032

Low

0203031

Medium

0006000

**** Exit Setup**

0006010
Enter Setup

Additional Settings for Type 1

Beep duration and frequency settings are designed only for Type 1 (which is a single tone) to serve specific applications.

Beep Duration

0203050
**** 80ms**

0203051
40ms

To learn how to program the parameter, see the **"d. Program the Duration of Good Decode Beep (Type 1)"** section in Appendix.

0203052
Custom (20~300ms)

0006000
****Exit Setup**

0006010
Enter Setup

Beep Frequency

0203060
800Hz

0203061
1600Hz

0203062
**** 2730Hz**

0203063
4200Hz

You may select the frequency same as the center frequency of your buzzer. To learn how to program this parameter, see the **"e. Program the Frequency of Good Decode Beep (Type 1)"** section in Appendix.

0203064
Custom (20~20000 Hz)

0006010
Enter Setup

LED Notification

Good Read LED Notification

Note: This feature is applicable to all scan modes.

0206010
Good Read LED Notification Off

0206011
**** Good Read LED Notification On**

LED Notification Duration for Good Read

0206020
**** Short (20ms)**

0206021
Medium (120ms)

0206022
Long (220ms)

0206023
Prolonged (320ms)

To learn how to program this parameter, see the “f. Program the LED Notification Duration for Good Decode” section in Appendix.

0206024
Custom (1~10000ms)

0006010
Enter Setup

Power LED

This feature allows you to turn the Power LED on or off. When the **Power LED On** barcode is scanned, the power LED is turned on after the engine is powered up.

0206001
Power LED On

0206000
**** Power LED Off**

0006000
**** Exit Setup**

0006010
Enter Setup

Chapter 7 Data Formatting

Introduction

In many applications, barcode data needs to be edited and distinguished from one another.

Usually AIM ID and Code ID can be used as identifiers, but in some special cases customized prefix and terminating character suffix like Carriage Return or Line Feed can also be the alternatives.

Data editing refers to appending prefix/suffix, data packing, etc.

Data formatting may include:

- Append AIM ID/Code ID/custom prefix before the decoded data
- Append custom suffix after the decoded data
- Pack data
- Append terminating character to the end of the data

0006000
****Exit Setup**

0006010
Enter Setup

General Settings

Enable/Disable All Prefix/Suffix

Disable All Prefix/Suffix: Transmit barcode data with no prefix/suffix.

Enable All Prefix/Suffix: Allow user to append Code ID prefix, AIM ID prefix, custom prefix/suffix and terminating character to the barcode data before the transmission.

0311010
Enable All Prefix/Suffix

0311000
**** Disable All Prefix/Suffix**

Prefix Sequences

0317010
****Code ID+Custom Prefix+AIM ID**

0317040
Custom Prefix+Code ID+AIM ID

0006000
**** Exit Setup**

0006010
Enter Setup

AIM ID Prefix

AIM (Automatic Identification Manufacturers) IDs and ISO/IEC 15424 standards define symbology identifiers and data carrier identifiers. (For the details, see the **"Appendix 2: AIM ID Table"** section). If AIM ID prefix is enabled, the engine will add the symbology identifier before the scanned data after decoding.

0308030
Enable AIM ID Prefix

0308000
**** Disable AIM ID Prefix**

Code ID Prefix

Code ID can also be used to identify barcode type. Unlike AIM ID, Code ID is user programmable. Code ID can only consist of one or two English letters.

0307010
Enable Code ID Prefix

0307000
**** Disable Code ID Prefix**

0006000
****Exit Setup**

0006010
Enter Setup

Restore All Default Code IDs

For the information of default Code IDs, see the **"Appendix 3: Code ID Table"** section.

0307020
Restore All Default Code IDs

Modify Code ID

Code ID of each symbology can be programmed separately. See the following example to learn how to program a Code ID.

Example: Set the Code ID of PDF417 to "p"

1. Check the hex value of "p" in the **Appendix 4: ASCII Table**. ("p": 70)
2. Scan the **Enter Setup** barcode.
3. Scan the **Modify PDF417 Code ID** barcode.
4. Scan the numeric barcodes "7" and "0".
5. Scan the **Save** barcode.
6. Scan the **Exit Setup** barcode.

0006010
Enter Setup

0005000
Modify PDF417 Code ID

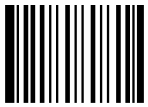
0005030
Modify Data Matrix Code ID

0005010
Modify QR Code ID

0005040
Modify Maxicode Code ID

0005020
Modify Aztec Code ID

0005070
Modify Chinese Sensible Code ID


0004040
Modify EAN-8 Code ID

0004050
Modify EAN-13 Code ID

0004060
Modify UPC-E Code ID

0004070
Modify UPC-A Code ID

0006000
****Exit Setup**

0006010
Enter Setup

0004020
Modify Code 128 Code ID

0004030
Modify UCC/EAN-128 Code ID

0004130
Modify Code 39 Code ID

0004170
Modify Code 93 Code ID

0004080
Modify Interleaved 2 of 5 Code ID

0004090
Modify ITF-14 Code ID

0004100
Modify ITF-6 Code ID

0004150
Modify Codabar Code ID

0004250
Modify Industrial 25 Code ID

0004260
Modify Standard 25 Code ID

0006000
** **Exit Setup**

0006010
Enter Setup

0004280
Modify Code 11 Code ID

0004270
Modify Plessey Code ID

0004290
Modify MSI-Plessey Code ID

0004310
Modify GS1 Databar Code ID

0004300
Modify Composite Code ID

0004240
Modify ISBN Code ID

0004110
Modify Matrix 2 of 5 Code ID

0004230
Modify ISSN Code ID

0005100
Modify Micro PDF417 Code ID

0006000
****Exit Setup**

0006010
Enter Setup

Custom Prefix

Enable/Disable Custom Prefix

If custom prefix is enabled, you are allowed to append to the data a user-defined prefix that cannot exceed 10 characters.

0305010
Enable Custom Prefix

0305000
** **Disable Custom Prefix**

Set Custom Prefix

To set a custom prefix, scan the **Set Custom Prefix** barcode and the numeric barcodes corresponding to the hexadecimal value of a desired prefix, and then scan the **Save** barcode.

Note: A custom prefix cannot exceed 10 characters.

0300000
Set Custom Prefix

Example: Set the custom prefix to "CODE"

1. Check the hex values of "CODE" in the ASCII Table. ("CODE": 43, 4F, 44, 45)
2. Scan the **Enter Setup** barcode.
3. Scan the **Set Custom Prefix** barcode.
4. Scan the numeric barcodes "4", "3", "4", "F", "4", "4", "4" and "5".
5. Scan the **Save** barcode.
6. Scan the **Exit Setup** barcode.

0006000
** **Exit Setup**

0006010
Enter Setup

Custom Suffix

Enable/Disable Custom Suffix

If custom suffix is enabled, you are allowed to append to the data a user-defined suffix that cannot exceed 10 characters.

0306010
Enable Custom Suffix

0306000
**** Disable Custom Suffix**

Set Custom Suffix

To set a custom suffix, scan the **Set Custom Suffix** barcode and the numeric barcodes corresponding to the hexadecimal value of a desired suffix, and then scan the **Save** barcode.

Note: A custom suffix cannot exceed 10 characters.

0301000
Set Custom Suffix

Example: Set the custom suffix to "CODE"

1. Check the hex values of "CODE" in the ASCII Table. ("CODE": 43, 4F, 44, 45)
2. Scan the **Enter Setup** barcode.
3. Scan the **Set Custom Suffix** barcode.
4. Scan the numeric barcodes "4", "3", "4", "F", "4", "4", "4" and "5".
5. Scan the **Save** barcode.
6. Scan the **Exit Setup** barcode.

0006000
****Exit Setup**

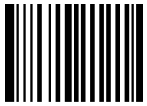
0006010
Enter Setup

Data Packing

For some applications that require high data integrity and reliability, data packing can help you accomplish that.

Transmission of packed data needs to work with certain software on the Host.

Data packing influences data format and is not recommended for general applications.


0314000

**** Disable Data Packing**

Normal Pack

Normal Pack format: [STX + ATTR + LEN] + [AL_TYPE + DATA] + [LRC]

- ✧ STX: 0x02
- ✧ ATTR: 0x00
- ✧ LEN: Barcode data length is expressed in 2 bytes, ranging from 0 to 65535.
- ✧ AL_TYPE: 0x36
- ✧ DATA: Raw barcode data.
- ✧ LRC: Checksum.

LRC calculation algorithm: computation sequence: 0xFF+LEN+AL_TYPE+DATA; computation method is XOR, byte by byte.

0314010

Normal Pack

0006000

**** Exit Setup**

0006010
Enter Setup

Terminating Character Suffix

A terminating character can be used to mark the end of data, which means nothing can be added after it.

A terminating character suffix can contain one or two characters.

Enable/Disable Terminating Character Suffix

To enable/disable terminating character suffix, scan the appropriate barcode below.

0309010
Enable Terminating Character Suffix

0309000
** Disable Terminating Character Suffix

0006000
****Exit Setup**

0006010

Enter Setup

Set Terminating Character Suffix

The engine provides a shortcut for setting the terminating character suffix to 0x0D (CR) or 0x0D,0x0A (CRLF) by scanning the following barcode.

0310010

Terminating Character 0x0D

0310020

Terminating Character 0x0D,0x0A

To set a terminating character suffix, scan the **Set Terminating Character Suffix** barcode and the numeric barcodes corresponding to the hexadecimal value of a desired terminating character, and then scan the **Save** barcode.

Note: A terminating character suffix cannot exceed 2 characters.

0310000

Set Terminating Character Suffix

Example: Set the terminating character suffix to 0x0D

1. Scan the **Enter Setup** barcode.
2. Scan the **Set Terminating Character Suffix** barcode.
3. Scan the numeric barcodes “0” and “D”.
4. Scan the **Save** barcode.
5. Scan the **Exit Setup** barcode.

0006000

** **Exit Setup**

0006010
Enter Setup

Chapter 8 Symbologies

General Settings

Enable/Disable All Symbologies

If the **Disable All Symbologies** feature is enabled, the engine can only identify the programming barcodes.

0001020
Enable All Symbologies

0001010
Disable All Symbologies

Enable/Disable 1D Symbologies

0001040
Enable 1D Symbologies

0001030
Disable 1D Symbologies

Enable/Disable 2D Symbologies

0001060
Enable 2D Symbologies

0001050
Disable 2D Symbologies

0006000
****Exit Setup**

0006010

Enter Setup

1D Symbologies

Code 128

Restore Factory Defaults

0400000

Restore the Factory Defaults of Code 128

Enable/Disable Code 128

0400020

**** Enable Code 128**

0400010

Disable Code 128

Set Length Range for Code 128

The engine can be configured to only decode Code 128 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0400030

Set the Minimum Length (Default: 1)

0400040

Set the Maximum Length (Default: 48)

0006000

**** Exit Setup**

0006010
Enter Setup

GS1-128 (UCC/EAN-128)

Restore Factory Defaults

0412000
Restore the Factory Defaults of GS1-128

Enable/Disable GS1-128

0412020
**** Enable GS1-128**

0412010
Disable GS1-128

Set Length Range for GS1-128

The engine can be configured to only decode GS1-128 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0412030
Set the Minimum Length (Default: 1)

0412040
Set the Maximum Length (Default: 48)

0006000
****Exit Setup**

0006010
Enter Setup

EAN-8

Restore Factory Defaults

0401000

Restore the Factory Defaults of EAN-8

Enable/Disable EAN-8

0401020

**** Enable EAN-8**

0401010

Disable EAN-8

Transmit Check Digit

EAN-8 is 8 digits in length with the last one as its check digit used to verify the integrity of the data.

0401040

**** Transmit EAN-8 Check Digit**

0401030

Do Not Transmit EAN-8 Check Digit

0006000

**** Exit Setup**

0006010
Enter Setup

Add-On Code

An EAN-8 barcode can be augmented with a two-digit or five-digit add-on code to form a new one. In the examples below, the part surrounded by blue dotted line is an EAN-8 barcode while the part circled by red dotted line is add-on code.

0401060
Enable 2-Digit Add-On Code

0401050
**** Disable 2-Digit Add-On Code**

0401080
Enable 5-Digit Add-On Code

0401070
**** Disable 5-Digit Add-On Code**

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The engine decodes a mix of EAN-8 barcodes with and without 2-digit/5-digit add-on codes.

Disable 2-Digit Add-On Code/ Disable 5-Digit Add-On Code: The engine decodes EAN-8 and ignores the add-on code when presented with an EAN-8 plus add-on barcode. It can also decode EAN-8 barcodes without add-on codes.

0006010
Enter Setup

EAN-8 Extension

Disable EAN-8 Zero Extend: Transmit EAN-8 barcodes as is.

Enable EAN-8 Zero Extend: Add five leading zeros to decoded EAN-8 barcodes to extend to13 digits.

0401100
Enable EAN-8 Zero Extend

0401090
**** Disable EAN-8 Zero Extend**

0006010
Enter Setup

EAN-13

Restore Factory Defaults

0402000

Restore the Factory Defaults of EAN-13

Enable/Disable EAN-13

0402020

**** Enable EAN-13**

0402010

Disable EAN-13

Transmit Check Digit

0402040

**** Transmit EAN-13 Check Digit**

0402030

Do Not Transmit EAN-13 Check Digit

0006000

****Exit Setup**

0006010

Enter Setup

Add-On Code

An EAN-13 barcode can be augmented with a two-digit or five-digit add-on code to form a new one.

0402060

Enable 2-Digit Add-On Code

0402050

**** Disable 2-Digit Add-On Code**

0402080

Enable 5-Digit Add-On Code

0402070

**** Disable 5-Digit Add-On Code**

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The engine decodes a mix of EAN-13 barcodes with and without 2-digit/5-digit add-on codes.

Disable 2-Digit Add-On Code/ Disable 5-Digit Add-On Code: The engine decodes EAN-13 and ignores the add-on code when presented with an EAN-13 plus add-on barcode. It can also decode EAN-13 barcodes without add-on codes.

0006000

**** Exit Setup**

0006010
Enter Setup

ISBN

Restore Factory Defaults

0416000

Restore the Factory Defaults of ISBN

Enable/Disable ISBN

0416020

Enable ISBN

0416010

**** Disable ISBN**

Set ISBN Format

0416030

****ISBN-13**

0416040

ISBN-10

0006000

****Exit Setup**

0006010
Enter Setup

UPC-E

Restore Factory Defaults

0403000

Restore the Factory Defaults of UPC-E

Enable/Disable UPC-E

0403020

**** Enable UPC-E**

0403010

Disable UPC-E

Transmit Check Digit

0403040

**** Transmit UPC-E Check Digit**

0403030

Do Not Transmit UPC-E Check Digit

0006000

**** Exit Setup**

0006010
Enter Setup

Add-On Code

A UPC-E barcode can be augmented with a two-digit or five-digit add-on code to form a new one.

0403060
Enable 2-Digit Add-On Code

0403050
** **Disable 2-Digit Add-On Code**

0403080
Enable 5-Digit Add-On Code

0403070
** **Disable 5-Digit Add-On Code**

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The engine decodes a mix of UPC-E barcodes with and without 2-digit/5-digit add-on codes.

Disable 2-Digit Add-On Code/ Disable 5-Digit Add-On Code: The engine decodes UPC-E and ignores the add-on code when presented with a UPC-E plus add-on barcode. It can also decode UPC-E barcodes without add-on codes.

0006010
Enter Setup

UPC-E Preamble

Preamble characters (Country Code and System Character) can be transmitted as part of a UPC-E barcode. Select one of the following options for transmitting UPC-E preamble to the host device: transmit system character only, transmit system character and country code (“0” for USA), or transmit no preamble.

0403090
**** No Preamble (<DATA>)**

0403100
System Character (<SYSTEM CHARACTER><DATA>)

0403140
System Character & Country Code(< COUNTRY CODE><SYSTEM CHARACTER><DATA>)

Convert UPC-E to UPC-A

Do Not Convert UPC-E to UPC-A: Transmit UPC-E barcodes as is.

Convert UPC-E to UPC-A: Enable this to convert UPC-E decoded data to UPC-A format before transmission. After conversion, the data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Digit)..

0403110
**** Do Not Convert UPC-E to UPC-A**

0403130
Convert UPC-E to UPC-A

0006000
**** Exit Setup**

0006010
Enter Setup

UPC-A

Restore Factory Defaults

0404000

Restore the Factory Defaults of UPC-A

Enable/Disable UPC-A

0404020

**** Enable UPC-A**

0404010

Disable UPC-A

Transmit Check Digit

0404040

**** Transmit UPC-A Check Digit**

0404030

Do Not Transmit UPC-A Check Digit

0006000

****Exit Setup**

0006010
Enter Setup

Add-On Code

A UPC-A barcode can be augmented with a two-digit or five-digit add-on code to form a new one.

0404060
Enable 2-Digit Add-On Code

0404050
**** Disable 2-Digit Add-On Code**

0404080
Enable 5-Digit Add-On Code

0404070
**** Disable 5-Digit Add-On Code**

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The engine decodes a mix of UPC-A barcodes with and without 2-digit/5-digit add-on codes.

Disable 2-Digit Add-On Code/ Disable 5-Digit Add-On Code: The engine decodes UPC-A and ignores the add-on code when presented with a UPC-A plus add-on barcode. It can also decode UPC-A barcodes without add-on codes.

0006010
Enter Setup

UPC-A Preamble

Preamble characters (Country Code and System Character) can be transmitted as part of a UPC-A barcode. Select one of the following options for transmitting UPC-A preamble to the host device: transmit system character only, transmit system character and country code (“0” for USA), or transmit no preamble.

0404180
No Preamble (<DATA>)

0404090
**** System Character (<SYSTEM CHARACTER><DATA>)**

0404100
System Character & Country Code(< COUNTRY CODE><SYSTEM CHARACTER><DATA>)

0006000
****Exit Setup**

0006010
Enter Setup

Interleaved 2 of 5

Restore Factory Defaults

0405000

Restore the Factory Defaults of Interleaved 2 of 5

Enable/Disable Interleaved 2 of 5

0405020

**** Enable Interleaved 2 of 5**

0405010

Disable Interleaved 2 of 5

Set Length Range for Interleaved 2 of 5

The engine can be configured to only decode Interleaved 2 of 5 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0405030

Set the Minimum Length (Default: 6)

0405040

Set the Maximum Length (Default: 80)

0006000

**** Exit Setup**

0006010
Enter Setup

Check Digit Verification

A check digit is optional for Interleaved 2 o 5 and can be added as the last digit. It is a calculated value used to verify the integrity of the data.

Disable: The engine transmits Interleaved 2 of 5 barcodes as is.

Do Not Transmit Check Digit After Verification: The engine checks the integrity of all Interleaved 2 of 5 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.

Transmit Check Digit After Verification: The engine checks the integrity of all Interleaved 2 of 5 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

0405050
**** Disable**

0405060
Do Not Transmit Check Digit After Verification

0405070
Transmit Check Digit After Verification

Note: If the **Do Not Transmit Check Digit After Verification** option is enabled, Interleaved 2 of 5 barcodes with a length that is less than the configured minimum length after having the check digit excluded will not be decoded. (For example, when the **Do Not Transmit Check Digit After Verification** option is enabled and the minimum length is set to 4, Interleaved 2 of 5 barcodes with a total length of 4 characters including the check digit cannot be read.)

0006010
Enter Setup

Set Discrete Lengths for Interleaved 2 of 5

The engine can be configured to only decode Interleaved 2 of 5 barcodes within a specific length range or with a couple of discrete lengths.

The length must be an even number not greater than 64 and consist of three digits (a leading zero or zeros may need to be added to meet the length requirement). For more information, see the **"k. Program the Discrete Lengths for Interleaved 2 of 5"** section in Appendix.

0405150
Enable the Discrete Lengths

0405140
** **Disable the Discrete Lengths**

The discrete lengths become valid only when the **Enable the Discrete Lengths** option is enabled.

0405160
Set the Discrete Length

0405170
Delete the Discrete Length

0006000
** **Exit Setup**

0006010
Enter Setup

ITF-14

ITF-14 is a special kind of Interleaved 2 of 5 with a length of 14 characters and the last character as the check character.

0405080
**** Disable ITF-14**

0405090
Enable ITF-14 But Do Not Transmit Check Digit

0405100
Enable ITF-14 and Transmit Check Digit

Note: It is advisable not to enable ITF-14 and Interleaved 2 of 5 at the same time.

0006010
Enter Setup

ITF-6

ITF-6 is a special kind of Interleaved 2 of 5 with a length of 6 characters and the last character as the check character.

0405110
**** Disable ITF-6**

0405120
Enable ITF-6 But Do Not Transmit Check Digit

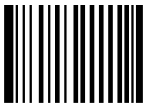
0405130
Enable ITF-6 and Transmit Check Digit

Note: It is advisable not to enable ITF-6 and Interleaved 2 of 5 at the same time.

0006010
Enter Setup

Matrix 2 of 5

Restore Factory Defaults

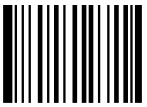

0406000

Restore the Factory Defaults of Matrix 2 of 5

Enable/Disable Matrix 2 of 5

0406020

Enable Matrix 2 of 5


0406010

**** Disable Matrix 2 of 5**

Set Length Range for Matrix 2 of 5

The engine can be configured to only decode Matrix 2 of 5 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0406030

Set the Minimum Length (Default: 4)

0406040

Set the Maximum Length (Default: 80)

0006000

****Exit Setup**

0006010
Enter Setup

Check Digit Verification

A check digit is optional for Matrix 2 of 5 and can be added as the last digit. It is a calculated value used to verify the integrity of the data.

Disable: The engine transmits Matrix 2 of 5 barcodes as is.

Do Not Transmit Check Digit After Verification: The engine checks the integrity of all Matrix 2 of 5 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.

Transmit Check Digit After Verification: The engine checks the integrity of all Matrix 2 of 5 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

0406050
**** Disable**

0406060
Do Not Transmit Check Digit After Verification

0406070
Transmit Check Digit After Verification

0006010
Enter Setup

Code 39

Restore Factory Defaults

0408000
Restore the Factory Defaults of Code 39

Enable/Disable Code 39

0408020
**** Enable Code 39**

0408010
Disable Code 39

Set Length Range for Code 39

The engine can be configured to only decode Code 39 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0408030
Set the Minimum Length (Default: 4)

0408040
Set the Maximum Length (Default: 48)

0006000
****Exit Setup**

0006010
Enter Setup

Check Digit Verification

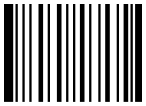
A check digit is optional for Code 39 and can be added as the last digit. It is a calculated value used to verify the integrity of the data.

Disable: The engine transmits Code 39 barcodes as is.

Do Not Transmit Check Digit After Verification: The engine checks the integrity of all Code 39 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.

Transmit Check Digit After Verification: The engine checks the integrity of all Code 39 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

0408050
**** Disable**


0408060
Do Not Transmit Check Digit After Verification

0408070
Transmit Check Digit After Verification

0006000
**** Exit Setup**

0006010
Enter Setup

Transmit Start/Stop Character

0408090
**** Transmit Start/Stop Character**

0408080
Do Not Transmit Start/Stop Character

Enable/Disable Code 39 Full ASCII

By default, the engine is only able to read some ASCII characters. You can configure your engine to identify all ASCII characters by scanning the appropriate barcode below.

0408110
Enable Code 39 Full ASCII

0408100
**** Disable Code 39 Full ASCII**

0006000
****Exit Setup**

0006010
Enter Setup

Convert Code 39 to Code 32

Code 32 is a variant of Code 39 used by the Italian pharmaceutical industry. Scan the appropriate barcode below to enable or disable converting Code 39 to Code 32. Code 39 must be enabled and Code 39 check digit verification must be disabled for this parameter to function.

0408120
**** Disable Convert Code 39 to Code 32**

0408130
Enable Convert Code 39 to Code 32

Code 32 Prefix

Scan the appropriate barcode below to enable or disable adding the prefix character “A” to all Code 32 bar codes. Convert Code 39 to Code 32 must be enabled for this parameter to function.

0408140
**** Disable Code 32 Prefix**

0408150
Enable Code 32 Prefix

0006000
**** Exit Setup**

0006010
Enter Setup

Codabar

Restore Factory Defaults

0409000

Restore the Factory Defaults of Codabar

Enable/Disable Codabar

0409020

**** Enable Codabar**

0409010

Disable Codabar

Set Length Range for Codabar

The engine can be configured to only decode Codabar barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0409030

Set the Minimum Length (Default: 2)

0409040

Set the Maximum Length (Default: 60)

0006000

****Exit Setup**

0006010
Enter Setup

Check Digit Verification

A check digit is optional for Codabar and can be added as the last digit. It is a calculated value used to verify the integrity of the data.

Disable: The engine transmits Codabar barcodes as is.

Do Not Transmit Check Digit After Verification: The engine checks the integrity of all Codabar barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.

Transmit Check Digit After Verification: The engine checks the integrity of all Codabar barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

0409050
** **Disable**

0409060
Do Not Transmit Check Digit After Verification

0409070
Transmit Check Digit After Verification

0006000
** **Exit Setup**

0006010
Enter Setup

Transmit Start/Stop Character

0409090

**** Transmit Start/Stop Character**

0409080

Do Not Transmit Start/Stop Character

Start/Stop Character Format

You can choose your desired start/stop characters format by scanning the appropriate barcode below.

0409100

**** ABCD/ABCD as the Start/Stop Character**

0409110

ABCD/TN*E as the Start/Stop Character

0409120

**** Start/Stop Character in Uppercase**

0409130

Start/Stop Character in Lowercase

0006010
Enter Setup

Code 93

Restore Factory Defaults

0410000

Restore the Factory Defaults of Code 93

Enable/Disable Code 93

0410020

Enable Code 93

0410010

**** Disable Code 93**

Set Length Range for Code 93

The engine can be configured to only decode Code 93 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0410030

Set the Minimum Length (Default: 1)

0410040

Set the Maximum Length (Default: 48)

0006000

**** Exit Setup**

0006010
Enter Setup

Check Digit Verification

Check digits are optional for Code 93 and can be added as the last two digits, which are calculated values used to verify the integrity of the data.

Disable: The engine transmits Code 93 barcodes as is.

Do Not Transmit Check Digit After Verification: The engine checks the integrity of all Code 93 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the checks will be transmitted except the last two digits, whereas those failing them will not be transmitted.

Transmit Check Digit After Verification: The engine checks the integrity of all Code 93 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the checks will be transmitted, whereas those failing them will not be transmitted.

0410050
Disable

0410060
** **Do Not Transmit Check Digit After Verification**

0410070
Transmit Check Digit After Verification

0006000
****Exit Setup**

0006010
Enter Setup

GS1-Databar (RSS)

Restore Factory Defaults

0413000

Restore the Factory Defaults of GS1-Databar

Enable/Disable GS1 Databar

0413020

**** Enable GS1-DataBar**

0413010

Disable GS1-DataBar

Transmit Application Identifier “01”

0413060

**** Transmit Application Identifier “01”**

0413050

Do Not Transmit Application Identifier “01”

0006010
Enter Setup

GS1 Composite Code

Restore Factory Defaults

0414000

Restore the Factory Defaults of GS1 Composite Code

Enable/Disable GS1 Composite Code

0414020

Enable GS1 Composite Code

0414010

**** Disable GS1 Composite Code**

EAN/UPC Composite

When EAN/UPC Composite is enabled, the engine will not be able to read standard EAN/UPC barcodes.

0414040

Enable EAN/UPC Composite

0414030

**** Disable EAN/UPC Composite**

0006000

****Exit Setup**

0006010
Enter Setup

Code 11

Restore Factory Defaults

0415000

Restore the Factory Defaults of Code 11

Enable/Disable Code 11

0415020

Enable Code 11

0415010

**** Disable Code 11**

Set Length Range for Code 11

The engine can be configured to only decode Code 11 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0415030

Set the Minimum Length (Default: 4)

0415040

Set the Maximum Length (Default: 48)

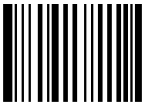
0006000

**** Exit Setup**

0006010
Enter Setup

Transmit Check Digit

0415120
**** Transmit Check Digit**


0415110
Do Not Transmit Check Digit

Check Digit Verification

0415050
Disable

0415060
**** One Check Digit, MOD11**

0415070
Two Check Digits, MOD11/MOD11

0415080
Two Check Digits, MOD11/MOD9

0415090
One Check Digit, MOD11 (Len<=10)
Two Check Digits, MOD11/MOD11 (Len>10)

0415100
One Check Digit, MOD11 (Len<=10)
Two Check Digits, MOD11/MOD9 (Len>10)

0006000
****Exit Setup**

0006010
Enter Setup

Industrial 2 of 5

Restore Factory Defaults

0417000

Restore the Factory Defaults of Industrial 2 of 5

Enable/Disable Industrial 2 of 5

0417020

Enable Industrial 2 of 5

0417010

**** Disable Industrial 2 of 5**

Set Length Range for Industrial 2 of 5

The engine can be configured to only decode Industrial 2 of 5 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0417030

Set the Minimum Length (Default: 6)

0417040

Set the Maximum Length (Default: 48)

0006000

**** Exit Setup**

0006010
Enter Setup

Check Digit Verification

A check digit is optional for Industrial 2 of 5 and can be added as the last digit. It is a calculated value used to verify the integrity of the data.

Disable: The engine transmits Industrial 2 of 5 barcodes as is.

Do Not Transmit Check Digit After Verification: The engine checks the integrity of all Industrial 2 of 5 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.

Transmit Check Digit After Verification: The engine checks the integrity of all Industrial 2 of 5 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

0417050
**** Disable**

0417060
Do Not Transmit Check Digit After Verification

0417070
Transmit Check Digit After Verification

0006010
Enter Setup

Standard 25

Restore Factory Defaults

0418000

Restore the Factory Defaults of Standard 25

Enable/Disable Standard 25

0418020

Enable Standard 25

0418010

**** Disable Standard 25**

Set Length Range for Standard 25

The engine can be configured to only decode Standard 25 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0418030

Set the Minimum Length (Default: 6)

0418040

Set the Maximum Length (Default: 48)

0006000

**** Exit Setup**

0006010
Enter Setup

Check Digit Verification

A check digit is optional for Standard 25 and can be added as the last digit. It is a calculated value used to verify the integrity of the data.

Disable: The engine transmits Standard 25 barcodes as is.

Do Not Transmit Check Digit After Verification: The engine checks the integrity of all Standard 25 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.

Transmit Check Digit After Verification: The engine checks the integrity of all Standard 25 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

0418050
**** Disable**

0418060
Do Not Transmit Check Digit After Verification

0418070
Transmit Check Digit After Verification

0006000
****Exit Setup**

0006010
Enter Setup

Plessey

Restore Factory Defaults

0419000

Restore the Factory Defaults of Plessey

Enable/Disable Plessey

0419020

Enable Plessey

0419010

**** Disable Plessey**

Set Length Range for Plessey

The engine can be configured to only decode Plessey barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0419030

Set the Minimum Length (Default: 4)

0419040

Set the Maximum Length (Default: 48)

0006000

**** Exit Setup**

0006010
Enter Setup

Check Digit Verification

Check digits are optional for Plessey and can be added as the last two digits, which are calculated values used to verify the integrity of the data.

Disable: The engine transmits Plessey barcodes as is.

Do Not Transmit Check Digit After Verification: The engine checks the integrity of all Plessey barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the checks will be transmitted except the last two digits, whereas those failing them will not be transmitted.

Transmit Check Digit After Verification: The engine checks the integrity of all Plessey barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the checks will be transmitted, whereas those failing them will not be transmitted.

0419050
Disable

0419060
Do Not Transmit Check Digit After Verification

0419070
**** Transmit Check Digit After Verification**

0006010
Enter Setup

MSI-Plessey

Restore Factory Defaults

0420000

Restore the Factory Defaults of MSI-Plessey

Enable/Disable MSI-Plessey

0420020

Enable MSI-Plessey

0420010

**** Disable MSI-Plessey**

Set Length Range for MSI-Plessey

The engine can be configured to only decode MSI-Plessey barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0420030

Set the Minimum Length (Default: 4)

0420040

Set the Maximum Length (Default: 48)

0006000

**** Exit Setup**

0006010
Enter Setup

Transmit Check Digit

0420100
**** Transmit Check Digit**

0420090
Do Not Transmit Check Digit

Check Digit Verification

0420050
Disable

0420060
**** One Check Digit, MOD10**

0420070
Two Check Digits, MOD10/MOD10

0420080
Two Check Digits, MOD10/MOD11

0006000
****Exit Setup**

0006010
Enter Setup

ISSN

Restore Factory Defaults

0421000

Restore the Factory Defaults of ISSN

Enable/Disable ISSN

0421020

Enable ISSN

0421010

**** Disable ISSN**

0006010
Enter Setup

2D Symbologies

PDF417

Restore Factory Defaults

0501000
Restore the Factory Defaults of PDF417

Enable/Disable PDF417

0501020
**** Enable PDF417**

0501010
Disable PDF417

Set Length Range for PDF417

The engine can be configured to only decode PDF417 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0501030
Set the Minimum Length (Default: 1)

0501040
Set the Maximum Length (Default: 2710)

0006000
****Exit Setup**

0006010
Enter Setup

PDF417 Inverse

Regular Barcode: Dark bars on a bright background.

Inverse Barcode: Bright bars on a dark background.

0501320

**** Decode Regular PDF417 Barcodes Only**

0501321

Decode Inverse PDF417 Barcodes Only

0501322

Decode Both

0006010
Enter Setup

PDF417 Twin Code

PDF417 twin code is 2 PDF417 barcodes paralleled vertically or horizontally. Two of them must have the same direction and similar specifications and be placed closely together.

There are 3 options for reading PDF417 twin codes:

Single PDF417 Only: Read either PDF417 code.

Twin PDF417 Only: Read both PDF417 codes. Transmission sequence: left (upper) PDF417 code followed by right (lower) PDF417 code.

Both Single & Twin: Read both PDF417 codes. If successful, transmit as twin PDF417 only. Otherwise, try single PDF417 only.

0501070
**** Single PDF417 Only**

0501080
Twin PDF417 Only

0501090
Both Single & Twin

0006000
****Exit Setup**

0006010
Enter Setup

Micro PDF417

Restore Factory Defaults

0511000

Restore the Factory Defaults of Micro PDF417

Enable/Disable Micro PDF417

0511020

Enable Micro PDF417

0511010

**** Disable Micro PDF417**

Set Length Range for Micro PDF417

The engine can be configured to only decode Micro PDF417 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0511030

Set the Minimum Length (Default: 1)

0511040

Set the Maximum Length (Default: 366)

0006000

**** Exit Setup**

0006010
Enter Setup

QR Code

Restore Factory Defaults

0502000

Restore the Factory Defaults of QR Code

Enable/Disable QR Code

0502020

**** Enable QR Code**

0502010

Disable QR Code

Set Length Range for QR Code

The engine can be configured to only decode QR Code barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0502030

Set the Minimum Length (Default: 1)

0502040

Set the Maximum Length (Default: 7089)

0006000

****Exit Setup**

0006010

Enter Setup

QR Twin Code

QR twin code is 2 QR barcodes paralleled vertically or horizontally. Two of them must have the same direction and similar specifications and be placed closely together.

There are 3 options for reading QR twin codes:

Single QR Only: Read either QR code.

Twin QR Only: Read both QR codes. Transmission sequence: left (upper) QR code followed by right (lower) QR code.

Both Single & Twin: Read both QR codes. If successful, transmit as twin QR only. Otherwise, try single QR only.

0502070

**** Single QR Only**

0502080

Twin QR Only

0502090

Both Single & Twin

Micro QR

0502100

**** Enable Micro QR**

0502110

Disable Micro QR

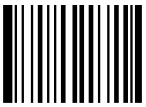
0006000

**** Exit Setup**

0006010
Enter Setup

Aztec Code

Restore Factory Defaults


0503000

Restore the Factory Defaults of Aztec Code

Enable/Disable Aztec Code

0503020

Enable Aztec Code

0503010

**** Disable Aztec Code**

Set Length Range for Aztec Code

The engine can be configured to only decode Aztec Code barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0503030

Set the Minimum Length (Default: 1)

0503040

Set the Maximum Length (Default: 3832)

0006000

****Exit Setup**

0006010
Enter Setup

Read Multi-barcodes on an Image

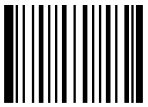
There are three modes:

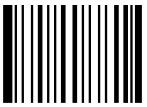
Mode 1: Read one barcode only.

Mode 2: Read fixed number of barcodes only.

Mode 3: Composite Reading. Read fixed number of barcodes first. If unsuccessful, read one barcode only.

0503070
**** Mode 1**


0503080
Mode 2


0503090
Mode 3

0006010
Enter Setup

Set the Number of Barcodes

0503060
** 1

0503061
2

0503062
3

0503063
4

0503064
5

0503065
6

0503066
7

0503067
8

0006000
**Exit Setup

0006010
Enter Setup

Data Matrix

Restore Factory Defaults

0504000

Restore the Factory Defaults of Data Matrix

Enable/Disable Data Matrix

0504020

****Enable Data Matrix**

0504010

Disable Data Matrix

Set Length Range for Data Matrix

The engine can be configured to only decode Data Matrix barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0504030

Set the Minimum Length (Default: 1)

0504040

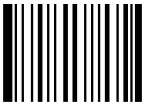
Set the Maximum Length (Default: 3116)

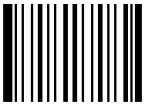
0006000

** **Exit Setup**

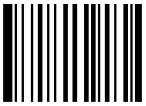
0006010
Enter Setup

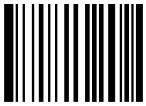
Rectangular Barcode

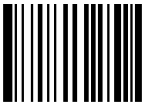

0504110
**** Enable Rectangular Barcode**


0504100
Disable Rectangular Barcode

Data Matrix Inverse


0504320
**** Decode Regular Data Matrix Barcodes Only**


0504321
Decode Inverse Data Matrix Barcodes Only


0504322
Decode Both

0006000
****Exit Setup**

0006010

Enter Setup

Data Matrix Twin Code

Data Matrix twin code is 2 Data Matrix barcodes paralleled vertically or horizontally. Two of them must have the same direction and similar specifications and be placed closely together.

There are 3 options for reading Data Matrix twin codes:

Single Data Matrix Only: Read either Data Matrix code.

Twin Data Matrix Only: Read both Data Matrix codes. Transmission sequence: left (upper) Data Matrix code followed by right (lower) Data Matrix code.

Both Single & Twin: Read both Data Matrix codes. If successful, transmit as twin Data Matrix only. Otherwise, try single Data Matrix only.

0504070

**** Single Data Matrix Only**

0504090

Both Single & Twin

0504080

Twin Data Matrix Only

0006000

**** Exit Setup**

0006010
Enter Setup

Maxicode

Restore Factory Defaults

0505000

Restore the Factory Defaults of Maxicode

Enable/Disable Maxicode

0505020

Enable Maxicode

0505010

**** Disable Maxicode**

Set Length Range for Maxicode

The engine can be configured to only decode Maxicode barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0505030

Set the Minimum Length (Default: 1)

0505040

Set the Maximum Length (Default: 150)

0006000

****Exit Setup**

0006010
Enter Setup

Chinese Sensible Code

Restore Factory Defaults

0508000

Restore the Factory Defaults of Chinese Sensible Code

Enable/Disable Chinese Sensible Code

0508020

Enable Chinese Sensible Code

0508010

**** Disable Chinese Sensible Code**

Set Length Range for Chinese Sensible Code

The engine can be configured to only decode Chinese Sensible barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

For more information, see the **"j. Program the Length Range (Maximum/Mininum Lengths) for a Symbology"** section in Appendix.

0508030

Set the Minimum Length (Default: 1)

0508040

Set the Maximum Length (Default: 7827)

0006000

**** Exit Setup**

0006010
Enter Setup

Chinese Sensible Code Inverse

0508080

**** Decode Regular Chinese Sensible Barcodes Only**

0508081

Decode Inverse Chinese Sensible Barcodes Only

0508082

Decode Both

Chapter 9 Troubleshooting

FAQ

Q: How to show barcode data in a text file (output data in a cursor)?

A: Enable the USB HID-KBW feature. But only characters and digits available on the keyboard can be sent.

Q: What are compatible/supported barcode types?

A: See the User Guide.

Q: How to change the format from ISBN-13 into ISBN-10?

A: Disable EAN-13 and then enable ISBN and ISBN-10.

Q: Some barcodes can't be read.

a) Find out the barcode type and check if the barcode type is enabled. See Appendix 1: Factory Defaults Table for default barcode types.
b) If the barcode type is enabled, check whether the check digit verification and length range settings match the barcodes.
c) If the barcodes are stained, defaced, torn, distorted or poorly printed, try barcodes of good print quality. If you need to scan barcodes off mobile phones, enable the Mobile Phone Mode.
d) Provide such information as model number, firmware version and barcode type when contacting our technical support.

Q: Some barcodes are decoded incorrectly.

a) Check whether the check digit verification and length range settings match the barcodes.
b) Provide such information as model number, firmware version and barcode type when contacting our technical support.

Q: Barcodes can be read, but cannot be displayed.

A: If barcodes contain non-alphanumeric character(s), change the communication mode (USB COM Port Emulation recommended).

Q: The device is frozen or unresponsive.

a) Check if the device is properly connected and powered up.

b) Send the Restore All Factory Defaults command to the device via a serial cable or USB cable.

Q: How to enable/disable terminating character (Carriage Return or Line Feed)?

A: See the User Guide.

Q: The device fails to communicate with QuickSet or UExpress.

A: Enable the USB Datapipe or USB COM Port Emulation feature.

Appendix

Appendix 1: Factory Defaults Table

Parameter	Factory Default	Remark
System Settings		
Barcode Programming	Disabled	
Programming Barcode Data	Do not send	
Illumination	Normal	
Aiming Beam	Normal	
Good Read Beep	Enabled Type 1, 80ms (Duration), 2730Hz (Frequency), Loud (Volume)	
Startup Beep	Enabled	
Good Read LED Notification	Enabled, 20ms (Duration)	
Power LED	Disabled	
Scan Mode	Auto Mode	
Decode Session Timeout	3000ms	Range: 500- 3600000ms
Timeout between Decodes (Same Barcode)	Disabled, 1500ms	Range: 0-3600000ms
Scanning Preference	Regular Mode (scan barcodes on paper)	
Decode Area	Whole Area Decoding	
Central Area	20%	
Send Product Information upon Startup	Disabled	
Communication Interfaces		
Baud Rate	9600	Serial Communication Interface
Parity Check	None	Serial Communication Interface
Number of Data Bits	8	Serial Communication Interface
Number of Stop Bits	1	Serial Communication Interface
Hardware Flow Control	Disabled	Serial Communication Interface

Fast Mode	Disabled	USB HID-KBW
USB HID-KBW Speed	4ms	USB HID-KBW
USB Country Keyboard Type	US	USB HID-KBW
Beep on Unknown Character	Disabled	USB HID-KBW
Emulate ALT+Keypad	Disabled	USB HID-KBW
Function Key Mapping	Disabled	USB HID-KBW
Inter-Keystroke Delay	No Delay	USB HID-KBW
Caps Lock	Off	USB HID-KBW
Convert Case	No Case Conversion	USB HID-KBW
Emulate Numeric Keypad 1	Disabled	USB HID-KBW
Emulate Numeric Keypad 2	Disabled	USB HID-KBW
Data Formatting		
All Prefix/Suffix	Disabled	
Prefix Sequence	Code ID+Custom Prefix+AIM ID	Code ID+ Custom Prefix+ AIM ID+Data+ Custom Suffix + Terminating Character
AIM ID Prefix	Disabled	
Code ID Prefix	Disabled	1 or 2 English letters
Custom Prefix	Disabled	Max. 10 characters
Custom Suffix	Disabled	Max. 10 characters
Terminating Character Suffix	Disabled	Max. 2 characters
Data Packing	Disabled	
Symbologies		
Code 128		
Code 128	Enabled	
Maximum Length	48	
Minimum Length	1	
EAN-8		
EAN-8	Enabled	
Check Digit	Transmit	
2-Digit Add-On Code	Disabled	

5-Digit Add-On Code	Disabled	
Extend to EAN-13	Disabled	
EAN-13		
EAN-13	Enabled	
Check Digit	Transmit	
2-Digit Add-On Code	Disabled	
5-Digit Add-On Code	Disabled	
UPC-E		
UPC-E	Enabled	
Check Digit	Transmit	
2-Digit Add-On Code	Disabled	
5-Digit Add-On Code	Disabled	
Preamble Character	No Preamble (<DATA>)	
Convert UPC-E to UPC-A	Disabled	
UPC-A		
UPC-A	Enabled	
Check Digit	Transmit	
2-Digit Add-On Code	Disabled	
5-Digit Add-On Code	Disabled	
Preamble Character	System Character (<SYSTEM CHARACTER><DATA>)	
Interleaved 2 of 5		
Interleaved 2 of 5	Enabled	
Check Digit Verification	Disabled	
Check Digit	Do not transmit	
Maximum Length	80	
Minimum Length	6	Minimum length supported: 4
Discrete Length	Disabled	
ITF-6		
ITF-6	Disabled	
ITF-14		

ITF-14	Disabled	
Code 39		
Code 39	Enabled	
Check Digit Verification	Disabled	
Start/Stop Character	Transmit	
Code 39 Full ASCII	Disabled	
Convert Code 39 to Code 32	Disabled	
Code 32 Prefix	Disabled	
Maximum Length	48	
Minimum Length	4	
Codabar		
Codebar	Enabled	
Check Digit Verification	Disabled	
Start/Stop Character	ABCD/ABCD format Uppercase Transmit	
Maximum Length	60	
Minimum Length	2	
Code 93		
Code 93	Disabled	
Check Digit Verification	Enabled	
Check Digit	Do not transmit	
Maximum Length	48	
Minimum Length	1	Minimum length supported: 1
GS1-128 (UCC/EAN-128)		
GS1-128 (UCC/EAN-128)	Enabled	
Maximum Length	48	
Minimum Length	1	
GS1 Databar(RSS)		
GS1 Databar(RSS)	Enabled	
Application Identifier “01”	Transmit	

GS1 Composite (EAN•UCC Composite)		
GS1 Composite	Disabled	
UPC/EAN Composite	Disabled	
Code 11		
Code 11	Disabled	
Check Digit	Transmit	
Check Digit Verification	1 Check Digit, MOD11	
Maximum Length	48	
Minimum Length	4	Minimum length supported: 4
ISBN		
ISBN	Disabled	
ISBN Format	ISBN-13	
Matrix 2 of 5(European Matrix 2 of 5)		
Maxtrix 2 of 5	Disabled	
Check Digit Verification	Disabled	
Maximum Length	80	
Minimum Length	4	Minimum length supported: 4
Industrial 25		
Industrial 25	Disabled	
Check Digit Verification	Disabled	
Maximum Length	48	
Minimum Length	6	Minimum length supported: 4
Standard 25		
Standard 25	Disabled	
Check Digit Verification	Disabled	
Maximum Length	48	
Minimum Length	6	Minimum length supported: 4
Plessey		
Plessey	Disabled	
Check Digit Verification	Enabled	
Check Digit	Transmit	

Maximum Length	48	
Minimum Length	4	Minimum length supported: 4
MSI-Plessey		
MSI-Plessey	Disabled	
Check Digit Verification	1 Check Digit, MOD10	
Check Digit	Transmit	
Maximum Length	48	
Minimum Length	4	Minimum length supported: 4
ISSN		
ISSN	Disabled	
PDF417		
PDF417	Enabled	
Read Single PDF417 Only	Enabled	
Maximum Length	2710	
Minimum Length	1	
PDF417 Inverse	Decode regular PDF417 barcodes only	
Micro PDF417		
Micro PDF417	Disabled	
Maximum Length	366	
Minimum Length	1	
QR Code		
QR Code	Enabled	
QR Twin Code	Read Single QR Only	
Micro QR	Enabled	
Maximum Length	7089	
Minimum Length	1	
Aztec		
Aztec	Disabled	
Read Multi-barcodes on an Image	Disabled	
Number of Barcodes	1	
Maximum Length	3832	

Minimum Length	1	
Data Matrix		
Data Matrix	Enabled	
DM Twin Code	Read Single Data Matrix Only	
Read Rectangular Barcode	Enabled	
Data Matrix Inverse	Decode regular Data Matrix barcodes only	
Maximum Length	3116	
Minimum Length	1	
Maxicode		
Maxicode	Disabled	
Maximum Length	150	
Minimum Length	1	
Chinese Sensible Code		
Chinese Sensible Code	Disabled	
Chinese Sensible Code Inverse	Decode regular Chinese Sensible barcodes only	
Maximum Length	7827	
Minimum Length	1	

Appendix 2: AIM ID Table

Symbology	AIM ID	Possible AIM ID Modifiers (m)
Code 128	]C0	
GS1-128 (UCC/EAN-128)	]C1	
EAN-8	]E4	
EAN-13	]E0	
EAN-13 with Addon	]E3	
UPC-E	]E0	
UPC-E with Addon	]E3	
UPC-A	]E0	
UPC-A with Addon	]E3	
Interleaved 2 of 5	]Im	0,1,3
ITF-6	]Im	1,3
ITF-14	]Im	1,3
Matrix 2 of 5	]X0	
Code 39	]Am	0,1,3,4,5,7
Codabar	]Fm	0,2,4
Code 93	]G0	
Code 11	]Hm	0,1,3
ISBN	]X0	
Industrial 25	]S0	
Standard 25	]R0	
Plessey	]P0	
MSI-Plessey	]Mm	0,1
GS1 Databar(RSS)	]e0	
GS1Composite Code	]em	0-3
ISSN	]X0	
PDF417	]Lm	0-2
Micro PDF417	]Lm	0-5
QR Code	]Qm	0-6
Aztec	]zm	0-9, A-C
Data Matrix	]dm	0-6
Maxicode	]Um	0-3
Chinese Sensible Code	]X0	

Note: “m” represents the AIM modifier character. Refer to ISO/IEC 15424:2008 Information technology – Automatic identification and data capture techniques – Data Carrier Identifiers (including Symbology Identifiers) for AIM modifier character details.

Appendix 3: Code ID Table

Symbology	Code ID
Code 128	j
GS1-128 (UCC/EAN-128)	j
EAN-8	d
EAN-13	d
UPC-E	c
UPC-A	c
Interleaved 2 of 5	e
ITF-6	e
ITF-14	e
Matrix 2 of 5	v
Code 39	b
Codabar	a
Code 93	i
Code 11	H
GS1 Databar(RSS)	R
GS1Composite Code(EAN•UCC Composite)	y
ISBN	B
Matrix 2 of 5(European Matrix 2 of 5)	v
Industrial 25	I
Standard 25	f
Plessey	n
MSI-Plessey	m
ISSN	g
PDF417	r
Micro PDF417	R
QR Code	s
Aztec	z
Data Matrix	u
Maxicode	x
Chinese Sensible Code	h

Appendix 4: ASCII Table

Hex	Dec	Char
00	0	NUL (Null char.)
01	1	SOH (Start of Header)
02	2	STX (Start of Text)
03	3	ETX (End of Text)
04	4	EOT (End of Transmission)
05	5	ENQ (Enquiry)
06	6	ACK (Acknowledgment)
07	7	BEL (Bell)
08	8	BS (Backspace)
09	9	HT (Horizontal Tab)
0a	10	LF (Line Feed)
0b	11	VT (Vertical Tab)
0c	12	FF (Form Feed)
0d	13	CR (Carriage Return)
0e	14	SO (Shift Out)
0f	15	SI (Shift In)
10	16	DLE (Data Link Escape)
11	17	DC1 (XON) (Device Control 1)
12	18	DC2 (Device Control 2)
13	19	DC3 (XOFF) (Device Control 3)
14	20	DC4 (Device Control 4)
15	21	NAK (Negative Acknowledgement)
16	22	SYN (Synchronous Idle)
17	23	ETB (End of Trans. Block)
18	24	CAN (Cancel)
19	25	EM (End of Medium)
1a	26	SUB (Substitute)
1b	27	ESC (Escape)
1c	28	FS (File Separator)
1d	29	GS (Group Separator)

1e	30	RS	(Request to Send)
1f	31	US	(Unit Separator)
20	32	SP	(Space)
21	33	!	(Exclamation Mark)
22	34	"	(Double Quote)
23	35	#	(Number Sign)
24	36	$	(Dollar Sign)
25	37	%	(Percent)
26	38	&	(Ampersand)
27	39	`	(Single Quote)
28	40	(	(Right / Closing Parenthesis)
29	41	)	(Right / Closing Parenthesis)
2a	42	*	(Asterisk)
2b	43	+	(Plus)
2c	44	,	(Comma)
2d	45	-	(Minus / Dash)
2e	46	.	(Dot)
2f	47	/	(Forward Slash)
30	48	0	
31	49	1	
32	50	2	
33	51	3	
34	52	4	
35	53	5	
36	54	6	
37	55	7	
38	56	8	
39	57	9	
3a	58	:	(Colon)
3b	59	;	(Semi-colon)
3c	60	<	(Less Than)
3d	61	=	(Equal Sign)
3e	62	>	(Greater Than)
3f	63	?	(Question Mark)
40	64	@	(AT Symbol)

41	65	A
42	66	B
43	67	C
44	68	D
45	69	E
46	70	F
47	71	G
48	72	H
49	73	I
4a	74	J
4b	75	K
4c	76	L
4d	77	M
4e	78	N
4f	79	O
50	80	P
51	81	Q
52	82	R
53	83	S
54	84	T
55	85	U
56	86	V
57	87	W
58	88	X
59	89	Y
5a	90	Z
5b	91	[(Left / Opening Bracket)
5c	92	\ (Back Slash)
5d	93	] (Right / Closing Bracket)
5e	94	^ (Caret / Circumflex)
5f	95	_ (Underscore)
60	96	' (Grave Accent)
61	97	a
62	98	b
63	99	c

64	100	d
65	101	e
66	102	f
67	103	g
68	104	h
69	105	i
6a	106	j
6b	107	k
6c	108	l
6d	109	m
6e	110	n
6f	111	o
70	112	p
71	113	q
72	114	r
73	115	s
74	116	t
75	117	u
76	118	v
77	119	w
78	120	x
79	121	y
7a	122	z
7b	123	{ (Left/ Opening Brace)
7c	124	| (Vertical Bar)
7d	125	} (Right/Closing Brace)
7e	126	~ (Tilde)
7f	127	DEL (Delete)

Appendix 5: Country Code Table

Country/Language	Code	Country/Language	Code
U.S.	0	Netherlands(Dutch)	14
Belgium	1	Norway	15
Brazil	2	Poland	16
Canada(French)	3	Portugal	17
Czechoslovakia	4	Romania	18
Denmark	5	Russia	19
Finland(Swedish)	6	Slovakia	21
France	7	Spain	22
Germany/Austria	8	Sweden	23
Greece	9	Switzerland(German)	24
Hungary	10	Turkey F	25
Israel(Hebrew)	11	Turkey Q	26
Italy	12	U.K.	27
Latin-American	13	Japan	28

Appendix 6: ASCII Function Key Mapping Table

ASCII Funciton	ASCII Value (HEX)	No Function Key Mapping	Function Key Mapping
NUL (Null char.)	00	Null	Ctrl+2
SOH (Start of Header)	01	Keypad Enter	Ctrl+A
STX (Start of Text)	02	Caps Lock	Ctrl+B
ETX (End of Text)	03	Null	Ctrl+C
EOT (End of Transmission)	04	Null	Ctrl+D
ENQ (Enquiry)	05	Null	Ctrl+E
ACK (Acknowledgment)	06	Null	Ctrl+F
BEL (Bell)	07	Enter	Ctrl+G
BS (Backspace)	08	Left Arrow	Ctrl+H
HT (Horizontal Tab)	09	Horizontal Tab	Ctrl+I
LF (Line Feed)	0A	Down Arrow	Ctrl+J
VT (Vertical Tab)	0B	Vertical Tab	Ctrl+K
FF (Form Feed)	0C	Backspace	Crtl+L
CR (Carriage Return)	0D	Enter	Ctrl+M
SO (Shift Out)	0E	Insert	Ctrl+N
SI (Shift In)	0F	Esc	Ctrl+O
DLE (Data Link Escape)	10	F11	Ctrl+P
DC1 (XON) (Device Control 1)	11	Home	Ctrl+Q
DC2 (Device Control 2)	12	Print Screen	Ctrl+R
DC3 (XOFF) (Device Control 3)	13	Delete	Ctrl+S
DC4 (Device Control 4)	14	tab+shift	Ctrl+T
NAK (Negative Acknowledgment)	15	F12	Ctrl+U
SYN (Synchronous Idle)	16	F1	Ctrl+V
ETB (End of Trans. Block)	17	F2	Ctrl+W
CAN (Cancel)	18	F3	Ctrl+X
EM (End of Medium)	19	F4	Ctrl+Y
SUB (Substitute)	1A	F5	Ctrl+Z
ESC (Escape)	1B	F6	See the following table
FS (File Separator)	1C	F7	
GS (Group Separator)	1D	F8	
RS (Request to Send)	1E	F9	
US (Unit Separator)	1F	F10	

ASCII Function Key Mapping Table (Continued)

The function key mappings of the last five characters in the table above differ from one keyboard layout to another.

Country/ Keyboard Layout	Function Key Mapping				
	1B	1C	1D	1E	1F
United States	Ctrl+[	Ctrl+\	Ctrl+]	Ctrl+6	Ctrl+-
Belgium	Ctrl+[	Ctrl+<	Ctrl+]	Ctrl+6	Ctrl+-
Scandinavia	Ctrl+8	Ctrl+<	Ctrl+9	Ctrl+6	Ctrl+-
France	Ctrl+^	Ctrl+8	Ctrl+$	Ctrl+6	Ctrl+=
Germany		Ctrl+Ã	Ctrl++	Ctrl+6	Ctrl+-
Italy		Ctrl+\	Ctrl++	Ctrl+6	Ctrl+-
Switzerland		Ctrl+<	Ctrl+.	Ctrl+6	Ctrl+-
United Kingdom	Ctrl+[	Ctrl+ ¢	Ctrl+]	Ctrl+6	Ctrl+-
Denmark	Ctrl+8	Ctrl+\	Ctrl+9	Ctrl+6	Ctrl+-
Norway	Ctrl+8	Ctrl+\	Ctrl+9	Ctrl+6	Ctrl+-
Spain	Ctrl+[	Ctrl+\	Ctrl+]	Ctrl+6	Ctrl+-

Appendix 7: Symbology ID Number

Symbology	ID Number	Symbology	ID Number
Code 128	002	Industrial 2 of 5	025
GS1-128 (UCC/EAN128)	003	Standard 2 of 5	026
EAN-8	004	Plessey	027
EAN-13	005	Code11	028
UPC-E	006	MSI/Plessey	029
UPC-A	007	Composite Code	030
Interleaved 2 of 5	008	GS1-Databar	031
ITF-14	009	PDF417	032
ITF-6	010	QR Code	033
Matrix 2 of 5	011	Aztec Code	034
Code 39	013	Data Matrix	035
Codabar	015	Maxicode	036
Code 93	017	Chinese Sensible Code	039
ISSN	023	Micro PDF417	042
ISBN	024		

Appendix 8: Parameter Programming Examples

The following examples show you how to program parameters by scanning programming barcodes.

a. Program the Decode Session Timeout

Example: Set the decode session timeout to 1500ms

1. Scan the **Enter Setup** barcode.
2. Scan the **Decode Session Timeout** barcode.
3. Scan the numeric barcodes “1”, “5”, “0” and “0”.
4. Scan the **Save** barcode.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

b. Program the Timeout between Decodes (Same Barcode)

Example: Set the timeout between decodes (same barcode) to 1000ms

1. Scan the **Enter Setup** barcode.
2. Scan the **Timeout between Decodes (Same Barcode)** barcode.
3. Scan the numeric barcodes “1”, “0”, “0” and “0”.
4. Scan the **Save** barcode.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

c. Program the Central Area

Example: Set the percentage of central area to 20%

1. Scan the **Enter Setup** barcode.
2. Scan the **Specify Central Area** barcode.
3. Scan the numeric barcodes “2” and “0”.
4. Scan the **Save** barcode.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

d. Program the Duration of Good Decode Beep (Type 1)

Example: Set the duration of good decode beep to 100ms

1. Scan the **Enter Setup** barcode.
2. Scan the **Custom (20~300ms)** barcode.
3. Scan the numeric barcodes “1”, “0” and “0”.
4. Scan the **Save** barcode.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

e. Program the Frequency of Good Decode Beep (Type 1)

Example: Set the frequency of good decode beep to 3000Hz

1. Scan the **Enter Setup** barcode.
2. Scan the **Custom (20~20000 Hz)** barcode.
3. Scan the numeric barcodes “3”, “0”, “0” and “0”.
4. Scan the **Save** barcode.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

f. Program the LED Notification Duration for Good Decode

Example: Set the LED notification duration to 2000ms

1. Scan the **Enter Setup** barcode.
2. Scan the **Custom (1~10000ms)** barcode.
3. Scan the numeric barcodes “2”, “0”, “0” and “0”。
4. Scan the **Save** barcode.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

g. Program the Custom Prefix/Suffix

Example: Set the custom prefix to “CODE”

1. Check the hex values of “CODE” in the ASCII Table. (“CODE”: 43, 4F, 44, 45)
2. Scan the **Enter Setup** barcode.
3. Scan the **Set Custom Prefix** barcode.
4. Scan the numeric barcodes “4”, “3”, “4”, “F”, “4”, “4”, “4” and “5”.
5. Scan the **Save** barcode.
6. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

h. Program the Terminating Character Suffix

Example: Set the terminating character suffix to 0x0A

1. Scan the **Enter Setup** barcode.
2. Scan the **Set Terminating Character Suffix** barcode.
3. Scan the numeric barcodes “0” and “A”.
4. Scan the **Save** barcode.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

i. Program the Code ID

Example: Set the Code ID of PDF417 to “p”

1. Check the hex value of “p” in the ASCII Table. (“p”: 70)
2. Scan the **Enter Setup** barcode.
3. Scan the **Modify PDF417 Code ID** barcode.
4. Scan the numeric barcodes “7” and “0”.
5. Scan the **Save** barcode.
6. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

j. Program the Length Range (Maximum/Minimum Lengths) for a Symbology

Note: For 1D symbologies, if minimum length is set to be greater than maximum length, the engine only decodes barcodes with either the minimum or maximum length. If you only want to read barcodes with a specific length, set both minimum and maximum lengths to be that desired length.

Example: Set the engine to decode Code 128 barcodes containing between 8 and 12 characters

1. Scan the **Enter Setup** barcode.
2. Scan the **Set the Minimum Length** barcode.
3. Scan the numeric barcode “8”.
4. Scan the **Save** barcode.
5. Scan the **Set the Maximum Length** barcode.
6. Scan the numeric barcodes “1” and “2”.
7. Scan the **Save** barcode.
8. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

k. Program the Discrete Lengths for Interleaved 2 of 5

Example 1: Set the engine to decode Interleaved 2 of 5 barcodes containing either 12 or 24 characters

1. Scan the **Enter Setup** barcode.
2. Scan the **Enable the Discrete Lengths** barcode.
3. Scan the **Set the Discrete Length** barcode.
4. Scan the numeric barcodes “0”, “1” and “2”.”
5. Scan the **Save** barcode.
6. Scan the **Set the Discrete Length** barcode.
7. can the numeric barcodes “0”, “2” and “4”.
8. Scan the **Save** barcode.
9. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

Example 2: Set the engine to decode Interleaved 2 of 5 barcodes containing between 12 and 24 characters

1. Scan the **Enter Setup** barcode.
2. Scan the **Enable the Discrete Lengths** barcode.”
3. Scan the **Set the Discrete Length** barcode.
4. Scan the numeric barcodes “0”, “1” and “2”.
5. Scan the numeric barcodes “0”, “2” and “4”.
6. Scan the **Save** barcode.
7. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

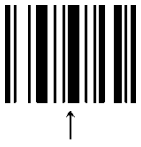
Appendix 9: F-Key Barcodes

When the HID-KBW feature is enabled, scanning one of the following barcodes will send the corresponding function key.

F1-F6

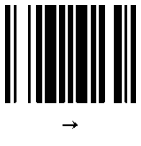
F1

F2



F3

F4



F5

F6

F7-F12

F7

F8

F9

F10

F11

F12

Appendix 10: Digit Barcodes

0-9

0

5

1

6

2

7

3

8

4

9

A-F

0000100

A

0000110

B

0000120

C

0000130

D

0000140

E

0000150

F

Appendix 11: Save/Cancel Barcodes

After reading numeric barcode(s), you need to scan the **Save** barcode to save the data. If you scan the wrong digit(s), you can either scan the **Cancel** barcode and then start the configuration all over again, or scan the **Delete the Last Digit** barcode and then the correct digit, or scan the **Delete All Digits** barcode and then the digits you want.

For instance, after reading the **Maximum Length** barcode and numeric barcodes “1”, “2” and “3”, you scan:

- **Delete the Last Digit:** The last digit “3” will be removed.
- **Delete All Digits:** All digits “123” will be removed.
- **Cancel:** The maximum length configuration will be cancelled. And the engine is still in the setup mode.

Save

Delete the Last Digit

Delete All Digits

Cancel

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